

Indoor pools-Trichloramine problem

Trichloramines are the primary chloramine present in the air above the water in pools/spas that primarily use chlorine as the required disinfectant for the water. Pools/spas that use bromine as their disinfectant may also develop this problem as bromine used as a sanitizer is not pure elemental bromine. The bromine sanitizer compounds contain chlorine as an oxidizer to promote the production of hypobromous acid.

A high level of trichloramine in the air at indoor pools may cause eye and upper respiratory irritation because it is a strong irritant to mucous membranes. Symptoms include excessive eye tearing, eye, nose and throat irritation and dry cough.

Chloramines are formed in chlorinated pool water when the chlorine combines with nitrogenous waste products from the swimmers such as sweat and urine. Since the chloramines are heavier than air, they will “hang” over the pool water surface and deck areas which will lead to comfort problems of the bathers at indoor pools when combined with ventilation inadequacies. Trichloramine is one of the chloramines formed. A high chloramine level in the pool water is evidenced by a “chlorine” smell in the air. That smell is actually from the high chloramine level, not from a properly chlorinated pool.

The following should be checked when troubleshooting for trichloramines:

- Chloramine level and pH of the pool water
- Ventilation
- Superchlorination/superoxidation frequency

CHLORAMINES:

Some prevention of chloramines can be achieved by educating the swimmers not to urinate in the pool, encouraging bathroom breaks, and showering before entering the pool.

Chloramines are eliminated from the pool water by breakpoint chlorination with chlorine or superoxidation with a non chlorine oxidizer. Indiana State Department of Health Swimming Pool Rule 410 IAC 6-2.1, Section 30(e) states: “The pool water shall be superchlorinated to breakpoint or superoxidized with a nonchlorine oxidizer, when the pool test kit reveals a combined chlorine (chloramine) concentration of five-tenths (0.5) parts per million (ppm) or greater.” Go to ISDH website for information on shocking the pool.

The formation of trichloramines will also increase with a low pH, therefore maintaining proper pH is another factor in prevention. Periodic addition of fresh water is also an important factor in prevention as it will dilute contaminants.

VENTILATION:

Ventilation is very important for chlorinated pools due to the production of chloramines during regular operation and superchlorination/superoxidation.

It is recommended that ventilation rate be a minimum of six air changes per hour, except where mechanical cooling is used. If there is mechanical cooling used, the recommendation is four to six changes per hour. The exhaust should be to the outside of the building. The recommendation for air temperature for public indoor pools is 2 to 5 degrees above the water temperature.

Insufficient air ventilation of the air directly above the water surface/deck level has also been found in facilities that have high trichloramine levels.

SUPERCHLORINATION/SUPEROXIDATION

All pools must be periodically superchlorinated to breakpoint/superoxidized to burn off chloramines. Please note that additional ventilation during this process is recommended. See ISDH website for more info on this topic.